

**BA SANGAM COLLEGE  
YEAR 13  
TECHNICAL DRAWING  
WORKSHEET 3**

*(Attempt the questions at the back of your exercise book)*

**ANSWER ALL THE 3 QUESTIONS**

**QUESTION 1 (20 marks)**

**Problem:** Chopping firewood still involves the use of manpower. In rural areas, where open fire cooking is still the predominant method of cooking, an abundant supply of firewood is a necessity.

**Brief:** Design a mechanism, to cut firewood to the required length and chop them to the right size for open fire cooking.

**Specification:** The mechanism must be:

1. safe to use,
2. relatively cheap to construct,
3. strong, portable and easy to operate,
4. operated using either human, mechanical, electrical or a combination of any two sources of power.

**Requirements:**

- (a) Produce **two** freehand pictorial sketches of the **mechanism**. **(8 marks)**
- (b) Evaluate each sketch on the following criteria:  
(i) materials  
(ii) functionality **(4 marks)**
- (c) Explain with the help of sketches how the mechanism will produce firewood. **(3 marks)**
- (d) Draw a pencil-rendered or a colour-rendered pictorial sketch of the final solution. **(5 marks)**

**QUESTION 2 (20 marks)**

**Problem:** Settlements that are closed to rivers or creeks are prone to flooding during heavy rainfall.

**Brief:** Design an overhead crossing from a suburban settlement to the main road for easy access members of the community.

**Specification:** The crossing must:

1. be strong, rigid and safe to use,
2. be relatively cheap to construct,
3. be creative and attractive when completed,
4. have ample space allowance for people while crossing.

**Requirements:**

- (a) Produce **two** freehand pictorial sketches of the **crossing**. **(8 marks)**
- (b) Evaluate each sketch on the following criteria:  
(i) materials  
(ii) functionality **(4 marks)**
- (c) Explain with the help of sketches show how each member of the structure is assembled. **(3 marks)**
- (d) Draw a pencil-rendered or a colour-rendered pictorial sketch of the final solution. **(5 marks)**

**Problem:** Some researchers planned to study wild animals at night. During the night they cannot light torches and lamps since it will distract the animals so to record their observations they need a light source to illuminate the writing surface.

**Brief:** Design a writing pen with Light Emitting Diode (LED) lights which would illuminate the writing surface when the pen is used in the dark. It should be battery powered and should have basic features of a pen.

**Specification:** The LED writing pen should:

1. have the LEDs installed in the pen.
2. be ergonomically designed but cheap.
3. be powered by one or two AAA batteries.
4. have a cap or a clip so that it can be kept securely in the pocket.

**Requirements:**

- (a) Produce **two** freehand pictorial sketches of the **LED pen**. **(8 marks)**
- (b) Evaluate each sketch on the following criteria:  
(i) materials  
(ii) functionality **(4 marks)**
- (c) Draw a **circuit diagram** of the LEDs. **(3 marks)**
- (d) Draw a pencil-rendered or a colour-rendered pictorial sketch of the final solution. **(5 marks)**